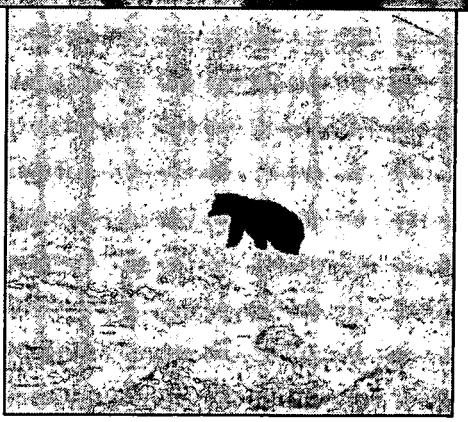
ECOLOGY

2002 Annual Ecology Report for the Rocky Flats Environmental Technology Site



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US Department of Energy
Rocky Flats Field Office
Golden, Colorado 80402-0464

By
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Contents

7.3.3 Raptors

One of the largest groups of predators that utilize the Site is the raptor group. Ecologically, raptors are an important taxonomic group because they require very specific nesting sites (mostly riparian woodland) and limit the populations of other species small mammal prey species).

During the 2002 sitewide surveys, there were 97 observations of raptors on Site. The most common raptor on Site is the Red Tailed Hawk (*Buteo jamaicensis*) and the American Kestrel (*Falco sparverius*) both with a relative abundance of almost 30 percent (Table 7-3). These two species are common on Site throughout the whole year, and have either been seen or are believed to be nesting on Site.

Three separate observations of red-tailed hawks exhibiting nesting/incubating behavior were made during the April and May surveys in 2002. These activities were associated with nests that were located in the south BZ. One nest was located in the Woman creek drainage. Two nests were located in the Smart ditch drainage. Juvenile red-tailed hawks were seen in the nest and the surrounding area during other BZ projects but not during the sitewide surveys therefore are not recorded in the survey database.

The American kestrel has been observed throughout the BZ. These birds frequently perch on transmission lines or powerpoles. Kestrels are cavity nesters and are believed to be using wood of the old Lindsey Ranch house or barn as nest sites. They have been observed flying out of, or perched on top of, the structures.

The next most common raptor on Site is the Great Horned Owl (*Bubo virginianus*). The Great Horned owl has been observed nesting on Site and can be observed throughout the Site year-round. A great horned owl has frequently been seen flying out of, or perched in, the Lindsey Ranch barn.

Other species of raptors, such as the swainson's hawk (*Buteo swainsoni*), were observed during parts of the year when those raptors are located in Colorado. In the case of the Swainson's hawk, there was one observation of the summer resident species during the July survey. The rough-legged hawk (*Buteo lagopus*) is a winter resident of the area and uses the same niche as the Swainson's hawk, but during different parts of the year. The rough-legged hawk was observed twice during the January survey, and three times during the February survey.

Other species of raptors observed on Site and their relative abundance are shown in Table 7-3. Two uncommon species of raptors were observed simultaneously in the same area. During the December sitewide survey (12/18/02), a large raptor was spotted in the Rock creek drainage. Upon further investigation, a juvenile bald eagle was observed perched on a snag tree next to the creek. A long eared owl was spotted in an adjacent cottonwood tree. After the bald eagle flew away, the area was investigated, and a dead female mule deer was found on the other side of the Site fence, just a few feet from the road. The deer was probably hit and killed by a car on Highway 128. The juvenile bald eagle might have been attracted by the carrion. The owl was at first thought to be a great horned owl, but as it was approached by the vehicle, it remained perched on the tree. Other than incubating/nesting great horned owls, most individuals of this species fly away as they are approached. The unusual behavior of this owl prompted the observers to investigate it further.

Other raptors seen during the 2002 sitewide surveys include Northern Harrier, Turkey Vulture, Golden Eagle, and Prairie Falcon.

7.3.4 Waterfowl

The most abundant species in waterfowl group were the dabbling ducks (Genus *Anas*). The relative abundance for the waterfowl taxonomic group was calculated, and the mallard duck *(Anas americana*) was the species with the highest relative abundance (32.55%, Table 7-4). As expected, waterfowl observations were mostly made near water structures such as the man-made ponds in Walnut and Woman Creek (Figure 7-6).

Other interesting observations of animals that were seen on Site during 2002 but were not recorded on any survey were black bear (*Ursus americanus*), elk (*Cervus elaphus*), and porcupine (*Erethizon dorsatum*). The black bear was seen in the Woman Creek drainage just south of the 130 trailer complex on 5/17/02.

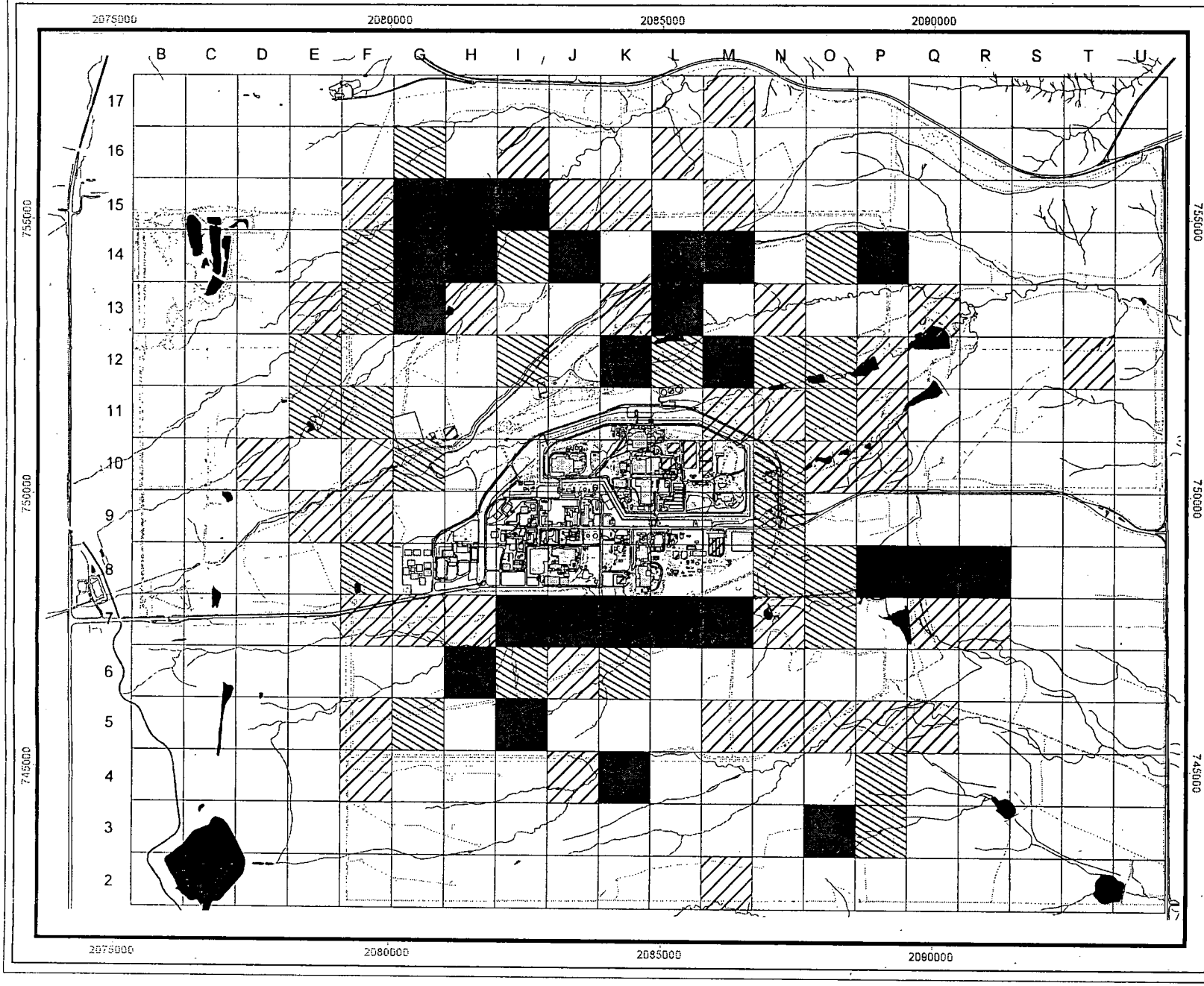
Several digital pictures were taken of the bear, which was heading in a northwesterly direction the last time it was seen.

Three adult female elk were seen several times in the early part of the summer in the western part of Rock Creek. The animals were usually seen in the riparian woodland and upland shrubland habitats. They were consistently seen until end of June. It is believed they were calving in the area.

A porcupine was seen in the riparian woodland area (on a tree) in the Rock Creek drainage. It looked like an adult. The area was searched several times after the original sighting, but the porcupine was not seen again.

7.4 Conclusions

The sitewide survey continued to document the presence of many of the significant wildlife species at the Site. Annual variations in relative abundance from 2001 to 2002 were documented, but are expected given this type of survey. Surveys conducted in 2002 continued to verify the high quality of habitat available in the Buffer Zone at the Site.



2002 Mule Deer Area Use

Figure 7-2

LEGEND

- Low Density (1-5 observations)
- Medium (6-15 observations)
- High (16+ observations)

Standard Features

- Buildings
- Demolished Buildings
- Lakes & ponds
- Streams & ditches
- Fences
- Paved roads
- Dirt roads
- Contours (20 ft. intervals)

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas.
Digitized from the orthophotographs, 1/95.

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1000 0 1000 2000 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: LABAT For: Kaiser-Hill Company, LLC

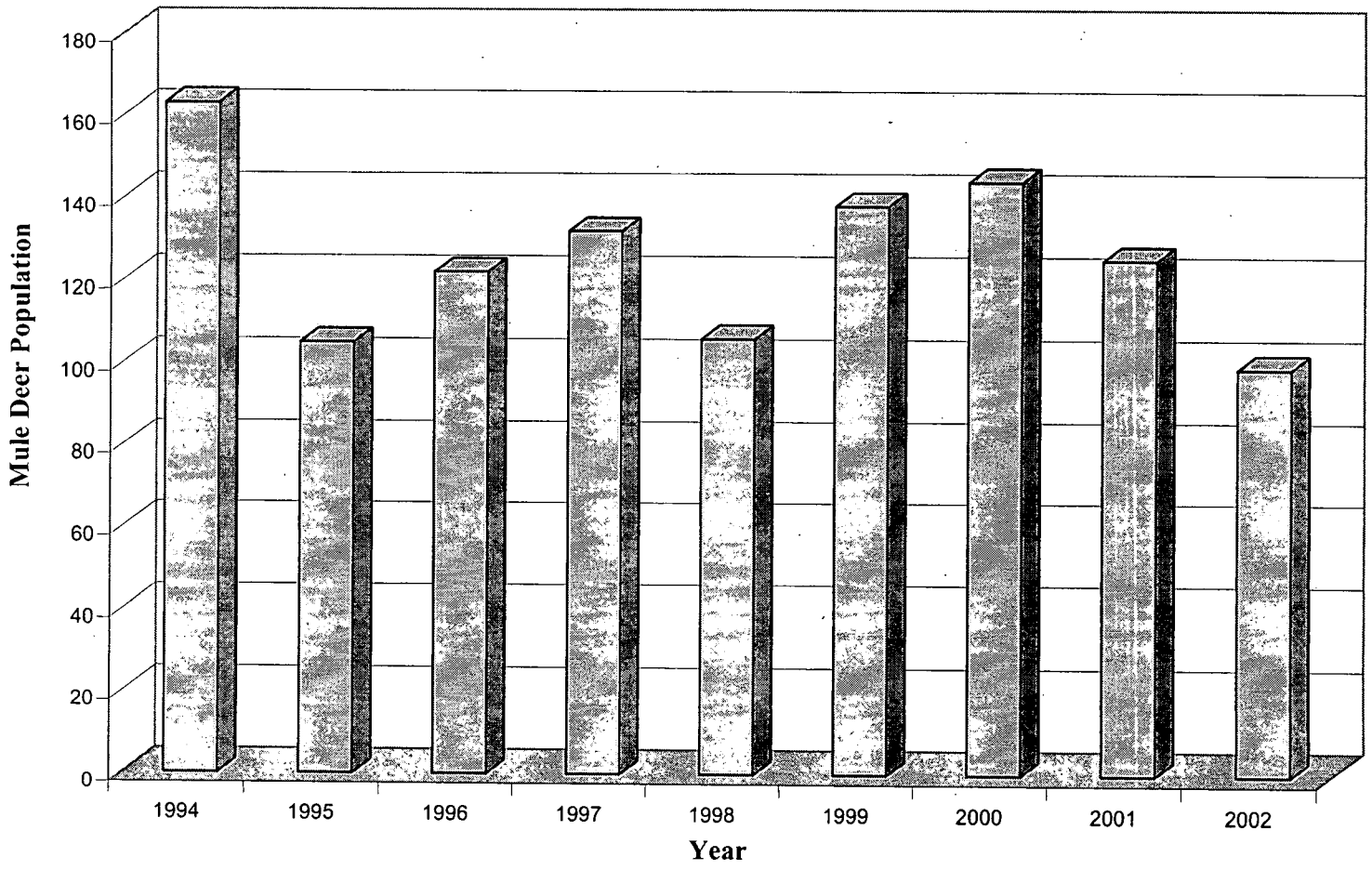
RFETS GIS Dept. 303-966-7707

MAP ID: 03-0018

June 18, 2003

O:\Projects\PY2003\03-0018\02\2002deer.apr\2002 deer use B size

Figure 7-3. Winter Mule Deer Counts (1994-2002)



the species were present in fewer numbers and were not visually dominating the landscape, but were beginning to establish a foothold in the community and were in need of control. The scattered-density category was used only in a few cases and indicated a sporadic occurrence of the species.

The noxious weed populations and distributions for the four dominant species mapped were drawn in the field on 44- × 34-inch sitewide base maps. The distributions of the other species were drawn on 11- × 17-inch sitewide base maps. With regard to the resulting maps, it should be noted that the boundaries shown on the maps are only approximate and are based on professional judgement. They should not be interpreted as a precise outline of the distribution of these species, because no surveying or global positioning system (GPS) equipment was used to locate boundary edges, nor do the maps necessarily represent every location of the species on the Site. Attempts were made to visit the entire Site, but some infestations may still have been missed.

4.2.2 Photographic Documentation

Photographs were taken at all the permanent photo points in the Buffer Zone (BZ) during the summer of 2002 to document and evaluate any changes resulting from climatic changes or natural resource management actions. Photographs were taken from established photo points in the same compass directions as past photographs. Photographs were then compared to those taken previously. Time-series photographs can be viewed in Appendix C on the CD-ROM.

4.2.3 Qualitative Habitat Assessments

Qualitative habitat assessments were made in all of the high-value vegetation community management units on the Site during 2002. Assessment objectives dealt primarily with habitat loss, threats to the plant community, weed issues, rare plant species, dominant plant species health in the community, and general community quality. Attempts were also made to revisit populations of CNHP-listed plant species of special concern that are known to occur on the Site. These species include the mountain-loving sedge (*Carex oreocharis*), forktip three-awn (*Aristida basiramea*), dwarf wild indigo (*Amorpha nana*), and carrionflower greenbriar (*Smilax herbacea* var. *lasioneuron*). Population locations were mapped originally during the 1997 field season. Most locations have been revisited annually to confirm the continued presence of these species on the Site and to evaluate any concerns about them.

Further details on the high-value vegetation monitoring methods are found in the document *High-Value Vegetation Survey Plan for the Rocky Flats Environmental Technology Site* (K-H 1997b), the *Environmental Management Department Operating Procedures Manual* (DOE 1995), and 2002 *Ecological Field Sampling Plans for the Rocky Flats Environmental Technology Site* (K-H 2002).

4.3 Results and Discussion

4.3.1 Rare-Plant Monitoring

Four plant species that occur at the Site are listed as rare and imperiled in Colorado by the Colorado Natural Heritage Program (CNHP 1999). The presence of these species underscores the significance of the natural resources found at the Site and its value in the regional landscape. Although none of them have any legal protection under state or federal law, they are protected at the Site and projects are modified to minimize potential impacts, as feasible. On-Site populations of mountain-loving sedge, forktip three-awn, carrionflower greenbriar, and dwarf wild indigo were revisited during 2002. All four species were observed in vegetative, flowering, and fruiting condition in 2002. All known locations where the species have been observed at the Site from 1997 through 2002 are shown in Figure 4-1.

Over the past several years qualitative observations of the only known location of forktip three-awn (south of the railroad tracks southwest of the raw water pond) at the Site have shown that the open, gravelly substrate that the species grows on has begun to fill in with other species of plants, slowly eliminating

habitat for the species. During fall 2001, an attempt was begun to try and establish some new populations of forktip three-awn at the Site. In October 2001, approximately 200 seeds were collected from mature, adult plants near the railroad tracks for seeding at a new location. On arrival at the new location in the west-central BZ where the seeds were going to be sown, it was discovered that hundreds of forktip three-awn plants were already growing at the location. As a result, another location with similar habitat was chosen in the south BZ, where no forktip three-awn plants were found, and the seeds were sown by broadcasting in two – one meter square plots (approximately 100 seeds per plot). In fall 2002, monitoring was conducted to determine whether any of the seeds had germinated, developed into adult plants, and produced any fruit.

At the two – one meter square plots several individuals of the forktip three-awn were observed in vegetative condition. One plot had a total of 25 plants present and while the other plot had a total of 28 individuals. The fact that the forktip three-awn germinated and grew so easily, even in drought conditions, would suggest it is not too difficult to establish new populations under suitable environmental conditions. The native, iron oxidized, reddish gravels typical of borrow areas and other disturbed areas where the topsoil has been scraped off at the Site seem very suited to the species. It might be feasible to increase the populations of forktip three-awn further at the Site by reseeding the species into closed BZ roads on the top of the pediment or on some of the areas where mine reclamation will take place or at some revegetation sites in the Industrial Area (IA).

During 2002, additional seed (approximately 400 seeds) was collected from the large population discovered along Walnut Creek, west of the IA in 2001. This seed was then planted in four - one meter square plots near where the seeding trials had been conducted in 2001. Approximately 100 seeds were placed in each plot in fall 2002. The southwest corner of each new plot was marked with a piece of rebar and a metal tag with the plot ID number to allow future relocation of the plots.

4.3.2 Weed Mapping

The 2002 weed distribution maps for diffuse knapweed, dalmatian toadflax, musk thistle, and common mullein are shown in Figures 4-2 through 4-5, respectively. The locations of infestations of several additional species—annual rye, Russian knapweed, Scotch thistle, dame's rocket, and bouncing bet—were also mapped in 2002 because of their aggressive nature and their recent appearance at various locations on the Site. The distributions of these species are shown in Figure 4-6. After being entered into the Site Geographic Information System (GIS), the overall extent of the more extensive species across the Site was estimated by species and by infestation level. Table 4-1 contains the estimated total acreage and acreage-by-density category for each of the species, based on the 2002 maps. The species with the greatest extent on the Site in 2002 were dalmatian toadflax (1264 acres), diffuse knapweed (1,093 acres), common mullein (965 acres), and musk thistle (468 acres). The total acreage of the Site is approximately 6,500 acres (K-H 1997c). It should be noted that all these acreages are only approximate and should not be interpreted as exact areas. These values are also only representative of known locations for these species. It is possible that unmapped infestations are present as well.

Table 4-2 shows the annual mapped total infested acreages for diffuse knapweed, musk thistle, and common mullein from 1997 to 2002. Most of the large increases in infestation acreages from 1997 to 1998 were a result of the time of year in which mapping was conducted. Mapping in 1997 was conducted in August for each of the species. Beginning in 1998, weed mapping was conducted for each species when that species was in flower and/or most visible. Therefore, the higher visibility of the species at the time of mapping allowed more accurate estimates of their infestation levels from 1998 through 2002, and thus resulted in higher acreages.

Since 1998, the total Site acreage infested by diffuse knapweed has decreased annually, largely due to the aerial herbicide applications conducted in 1999, 2000, 2001, and 2002. During 2002, about 884 acres were treated with Transline® and Tordon22K® using both ground and aerial applications. The Site currently has over 1800 acres less of diffuse knapweed than was present in 1998 and the high and medium density classifications are the lowest they have been since the aerial applications began. So the spraying program at the Site has been very successful. In 2002, it is also possible that the drought conditions and the different ecology personnel who conducted the mapping in 2002 may have accounted for some of the difference.

Most of the areas where herbicides have been applied are on the pediment tops of upper hillside areas in the drainages. Examination of the 2002 diffuse knapweed map (Figure 4-2) shows that at most of these locations diffuse knapweed have been controlled quite well. At other locations, however, primarily along the stream drainages, the infestations of diffuse knapweed have continued to increase through time because no chemical treatments have been done due to the close proximity of riparian vegetation and Preble's mouse habitat. Beginning in 2001 and continuing in 2002, several hundred biocontrol insects (*Larinus minutus* and *Sphenoptera jugoslavica*) were released in the drainages at the Site to begin to attempt to control the dense infestations present at these locations. Other biocontrol insects for diffuse knapweed, such as *Urophora* sp. and *Cyphocleonus achates* already occur at the Site from previous on-site releases and off-site immigration. Visual observations in 2002 showed there were literally millions of the *L. minutus* on the diffuse knapweed plants at the Site. If the species can be shown to reduce population levels in the drainages, it may be feasible to allow them to spread (as well as to introduce them) to the upper hillsides and pediment tops and control the diffuse knapweed at these locations as well, thus reducing the dependence on herbicide applications. (Biocontrol monitoring results are described in other sections of this annual report).

Dalmatian toadflax, musk thistle, and common mullein each showed decreases in the total number of acres infested at the Site in 2002 compared to previous years (Table 4-2). Of most significance is the large decrease in the amount of dalmatian toadflax infested acres. In 1999, the last time dalmatian toadflax was mapped, nearly 2500 acres of the Site was infested. As of 2002, only about half that, 1264 acres, had dalmatian toadflax on them and many of those at much reduced infestation densities. Large reductions were observed in the high, medium, and low classifications. Past annual vegetation reports (K-H 2002) have documented visually the effects of aerial herbicide applications of Tordon 22K® on dalmatian toadflax, both in terms of reduced flowering and reduced abundance. Based on the mapping data, it is apparent that many of the areas previously infested with the highest densities of dalmatian toadflax now have much lower density levels of the species, after treatment with the herbicides. So the herbicide applications have had some positive effect in reducing dalmatian toadflax levels at the Site.

4.3.3 Plant Community Disturbance in 2002

During 2002 several areas in the native plant communities in the Buffer Zone were disturbed by various projects (Figure 4-7). Along Walnut Creek, two flumes were being replaced – one at Indiana Pond near Indiana Street (GS03; 0.14 acres) and the other above the A-1 pond (SW093; 0.27 acres). Both areas disturbed Preble's mouse habitat and required formal consultation with the USFWS. Riparian vegetation was disturbed at both locations and will be replaced as part of the mitigation for the projects.

As part of the Site's cleanup and closure activities the new landfill, located northwest of the IA, was removed and revegetated with native plant species in May 2003. Monitoring as described in the Revegetation Monitoring section of this annual report may be conducted to evaluate the revegetation effort.

At the gravel mine operation in the northwest corner of the BZ, 1.8 acres of xeric tallgrass prairie was destroyed accidentally by the mine's earthmovers when they exceeded the acreage allowed for mining under their current mine permit (Figure 4-7). They notified DOE and reseeded the area. Figure 4-8 shows what the accidentally destroyed grassland areas looked like in early spring 2003.

In late 2002, it was discovered that additional sand had blown on the xeric tallgrass prairie from the mine in the northwest BZ as had happened during 2001. Figure 4-7 (a map) shows the overall area where sand was observed in early spring 2003 and Figure 4-9 shows some photographs of what the area looked like. A total of 7.0 acres had been covered with up to 30-38 cm (12-15 inches) of sand. At most locations the native prairie plants were buried. At one location the sand had been blown over the edge of the pediment and into part of the drainage. DOE had contacted the mine in 2002 and the issue of the sand had been discussed. After the latest deposition the mine erected two lines of snow fencing along the western edge of the prairie to stop the movement.

4.4 Conclusions

Qualitative monitoring of the high-value plant communities during 2002 revealed both positive and negative findings. The rare and imperiled plant species populations (as listed by the CNHP) at the Site appear to be healthy; all four rare species were observed in vegetative and flowering condition during 2002. The new populations of forktip three-awn discovered in 2001 in the Buffer Zone continued to do well. Attempts to transplant the forktip three-awn grass in new suitable habitat at the Site were successful and new plants were observed at the locations where seeds were placed in 2001.

The threat from noxious weeds continues to be a high management priority. No new species of noxious weeds were found at the Site during 2002. Several noxious weed species, however, continue to degrade the quality of the plant communities at the Site. Diffuse knapweed, dalmatian toadflax, musk thistle, common mullein, and Canada thistle are the most significant noxious weed problems. Substantial declines in the total number of acres currently infested by these species have been made since 1998. However, the scale of these infestations at the Site continue to challenge control efforts for the long-term. Other smaller infestations of newly discovered or recently invaded species like bouncing bet, Scotch thistle, Russian thistle, dame's rocket, and others continue to be controlled with the goal of eradication. In addition to herbicide applications in 2002, several hundred biocontrol insects were released at the Site to help control several different noxious weed species.

An additional source of degradation to the Site's natural resources continues to come from the mining activities located along the western edge of the Site. Expansion of the mine itself during 2002 resulted in the loss of several acres of xeric tallgrass prairie along with an additional 1.8 acres destroyed when the mine exceeded their permit allowance. Additionally, blowing sand from the mine buried seven acres of xeric tallgrass prairie.

Efforts continued to preserve and improve the quality of the natural resources at the Site. The value of the Site's ecological resources in the larger regional context has played an important role in the passage of a Congressional bill that will make the Site a National Wildlife Refuge after cleanup and closure. Efforts to integrate more of a comprehensive, ecosystem approach to resource management must be continued to restore natural processes if long-term sustainability of the native communities is to be achieved. Recent efforts have focused substantively on the noxious weeds themselves, without addressing the underlying conditions that have lead to the stressed condition of the native communities and contributed to the large-scale weed invasions. The use of prescribed fire and grazing are both crucial processes necessary for grassland health and management. As long-term management plans are developed for the National Wildlife Refuge the use of these and other resource management tools should be included to provide the best chance for long-term sustainability of the ecosystems at the Site.

4.5 References

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